



NEWSLETTER
OF THE EXOTIC FISH SECTION
AMERICAN FISHERIES SOCIETY

January, 1983

Christopher C. Kohler, Editor Volume 3, Number 1

From the President

The annual AFS meeting is always gratifying because of the opportunity for professional enhancement as well as having a chance to renew acquaintances. Unfortunately, tighter budgets and reduced travel funds makes it more difficult for most of us to attend. Since the section business session also suffers, I think our newsletter should become a more vital medium of communication. It relays items of common interest and it also carries important issues of business. The latter is particularly important for those who may not be at an annual meeting and it also permits discussion of pertinent items during the year.

An issue at this year's section meeting is an example of particular significance. The very fine report of the Definitions Committee prepared by Paul Shafland and Bill Lewis was presented and discussed. The report explored clarification of definitions of various fish introductions and favored broadening the definition of exotic to a more ecological orientation rather than the present political alignment. The report with the proposed definitions are included later in the newsletter. The current operating definition of exotic fishes according to our bylaws are those originating from a foreign land (EFS Newsletter, Vol. 1, No. 1). This definition is one commonly accepted and is generally in agreement with the position statement of the AFS (Trans. Amer. Fish. Soc. 102:274-276) although the AFS statement "a species not native to an ecosystem" can be interpreted to agree with the proposed definition. The committee report defines a fish as exotic if introduced into a drainage not formerly occupied by that species or a cogenetic species, whatever the country of origin.

The latter interpretation would expand our involvement and would consider many transplants by fishery managers as exotic stockings. As a section, we would stand to benefit through the possible attraction of members that have dealt with these ecological questions and who might aid in consideration of similar situations arising from foreign species transplants. This biological interpretation seems sound but we must consider that if it is to be workable it must be accepted. Fishery managers may not only disagree with this concept, they may strongly oppose its use.

Section acceptance of the broadened definition of exotic fishes will require a modification of the bylaws which must be accomplished by a positive vote from 2/3 of the membership. This, in effect, would be an opportunity to pass on the acceptability of the interpretation. The Definitions Committee will continue to explore this question, as interaction with the Fisheries Management Section seems appropriate. Also, I am sure the committee will welcome input from the membership on this issue.

Committee appointments are listed in the newsletter, if you would also desire to participate, contact the chairman. Committees seem to have various functional categories: 1) standing committees, which have recurring responsibilities, such as the Nominating/Ballot Committee; 2) more or less permanent committees, which are interest oriented and provide updated information to the membership, such as the grass carp/hybrid and tilapia committees; and 3) temporary or ad hoc type committees, which have specific tasks that culminate in a factual report. The definitions and protocol committees would appear to be categorized as such.

Some committees are perhaps conspicuous by their absence, such as resolutions and membership. A resolution committee does not seem necessary for our section although resolutions may be forthcoming. Resolutions in general are often thrust upon us at business meetings and there is little time to consider the issue. We see this in the parent society business session as well as our own. I think the Southern Division, AFS has a reasonable policy that requires newsletter publication prior to consideration at the annual business meeting. If we consider these guidelines and include "proposed resolutions" in our newsletter, we will have an opportunity to act on them in an orderly fashion. If you have a candidate resolution and choose to accept this suggestion, copies of the Southern Division guidelines are on file with the secretary and editor of our section.

Finally, we have attracted members without a formal membership committee and that would seem a good precedence. If we maintain an active and enthusiastic organization, we will keep our present members and others will want to join and participate in a dynamic group such as ours.

William L. Shelton

Officers and Committees, EFS---1983

Contributing Ed. -- Liaison FCS

Dr. R.O. Smitherman
Department of Fisheries
Auburn University, AL 36849
205/826-4786

Contributing Ed. -- Liaison Aquarium Trade

Dr. Robert G. Goldstein
4818 North Hills Dr.
Raleigh, N.C. 27612

Grass Carp/Hybrid

Chairman: Dr. James A. McCann
National Fishery
FWS
7920 N.W. 71st St.
Gainesville, FL 32601
904/378-8181

Dr. E.L. Torrans
Department of Agriculture
University of Arkansas-PB
Pine Bluff, AR 71601

James Monaghan
Fisheries Research Lab
Southern Illinois University
Carbondale, IL 62901

Tilapia Committee

Chairman: Dr. Walter R. Courtenay
Department of Biology
Florida Atlantic University
Boca Raton, FL 33431
305/393-3000

Dr. Stephen H. Bowen
Michigan Tech. University
Houghton, Michigan 49931

David D. Herlong
Harris Energy & Environ. Ctr.
Rt. 1, Box 294
New Hull, N.C. 27562

Definitions Committee

Chairman: Paul Shafland
Non-native Fish Research Lab
Florida Game & Fresh Water Fish
Commission
801 N.W. 40th St.
Boca Raton, FL 33431
305/391-6409

*Dr. Peter Moyle
Department of Wildlife & Fish
Biology
University of California
Davis, CA 95616

Dr. Richard Anderson
Missouri Coop. Fish. Res. Unit
FWS, Stephens Hall
University of Missouri
Columbia, Missouri 65211
314/882-3524

Nominating Committee

Chairman: Dr. Jon Stanley
Marine Coop. Fish. Res. Unit
FWS, 313 Murray Hall
University of Maine
Orono, Maine 04469
504/388-6051

Dr. Richard K. Noble
Dept. of Wildl. & Fish. Sci.
Texas A&M
College Station, TX 77843

Protocol Committee

Continuance of last year's members - Chris Kohler (Chairman), Jon Stanley and Jim McCann

Officers

President:

William L. Shelton
Zoology Department
University of Oklahoma
Norman, OK 73019
405/324-4821

President-Elect:

Christopher C. Kohler
Fisheries Research Lab
Southern Illinois University
Carbondale, IL 62901
618/453-2890

Secretary/Treasurer:

Jay R. Stauffer
Appalachian Env. Lab
University of Maryland
Frostburg State College Campus
Frostburg, Maryland 21532
301/689-3115

* Tentative

Minutes of 1982 AFS Exotic Fish Section Meeting
October, 1982, Hilton Head, South Carolina

Walter Courtenay called the meeting to order. The following reports were given and approved:

- 1) Liason Committee with Fish Culture Section - Bill Shelton
- 2) Report on Definition Committee which was prepared by Lewis and Shafland and summarized by Chris Kohler
- 3) J.R. Stauffer gave a brief synopsis of the status of the book entitled "Biology, Distribution, and Management of Exotic Fishes," which is edited by W. Courtenay and J. Stauffer.
- 4) Treasurer's Report - C. Kohler. There are now 215 members of the section.

Walt Courtenay turned the meeting over to the new president, Bill Shelton. Chris was elected as president-elect and Jay Stauffer as secretary-treasurer. The following committees will be continued:

- 1) Grass Carp Hybrid Committee
- 2) Fish Protocol Committee

Chris Kohler made a motion to distribute the report on fish terminology to every member. Walt Courtenay seconded the motion and it was passed. A letter from Paul Shafland was read which suggested a name change of the section. A motion was made (Courtenay), seconded (Stauffer) and passed which will defer this decision until after the terminology document is circulated to the members.

Courtenay introduced a resolution relative to the role of the National Fishery Research Laboratory in Gainesville. The resolution was adopted.

Courtenay and Stauffer announced their decision to donate any royalties of the exotic fish book to the AFS. It was decided to split those royalties so that 50% would go to the section and 50% to the society. Dave Herlong gave a report on the American Cichlid Society.

Jay R. Stauffer, Jr.

Meetings

International Symposium on Tilapia in Aquaculture. Tiberius, Israel, 8-13 May 1983. For info: Organizing committee International Symposium on Tilapia in Aquaculture, POB 3054, Tel Aviv 61030, Israel. Program sessions are established, abstracts were due October 31, 1982.

Aquaculture '83 - Fish Culture Section, AFS. 10-13 January 1983, Washington Hilton, Washington D.C. Joint meeting with World Mariculture Society, Catfish Farmers of America, U.S. Trout Farmers Association and Shellfish Institute of North America. Theme for AFS - Future Direction of Aquaculture.

First call for papers for the 1983 AFS meeting, 14-20 August 1983. For session organization, contact Chuck Coultant, Oak Ridge National Laboratory, Environmental Sciences Division, POB X, Oak Ridge, TN 37870. Abstract deadline is February 15, 1983.

From the Editor

As of December, 1982 we have 215 members of the Exotic Fish Sections; this gives us full voting status in the parent Society. Our first two years have been an unqualified success.

The Symposium held at the Albuquerque meeting in 1981 is culminating in the publication of "Distribution, Biology and Management of Exotic Fishes" by the prestigious Johns Hopkins University Press. Walt Courtenay, our Past-President, and Jay Stauffer, our current Secretary-Treasurer, have done an excellent job as editors and promoters.

Now that we have established ourselves as a major section of the American Fisheries Society, it is time for us to finally come to grips as to the scope of our Section. Oddly enough, one of our biggest stumbling blocks is our lack of agreement as to what an exotic fish actually is. How do we define our scope without first defining our name. Perhaps after we've defined our name, we'll want to find another.

Paul Shafland and Bill Lewis spent a great deal of time during the past year as members of the Section's Definitions Committee. They have drafted a document which is appended to this newsletter. I am asking each of our members to carefully read the entire document. What I want to do in coming newsletters is to develop a dialogue among our membership over the issues raised in this document. Please send your comments, suggestions, etc. to me (Fisheries Research Laboratory, Southern Illinois University, Carbondale, IL, 62901). I will take out excerpts from correspondence and publish them in future newsletter. I will also pass all correspondence on to Paul and his committee. I have been assured that both Paul and Bill have "thick-skins", and they will appreciate constructive comments. Indeed, the goal of their document was to establish such a dialogue in order that a consensus might eventually be reached. As the Exotic Fish Section, we members must get a better handle on "what is an exotic fish."

Christopher C. Kohler

INTRODUCED SPECIES TERMINOLOGY

PAUL L. SHAFLAND, NON-NATIVE FISH RESEARCH LABORATORY, FLORIDA
GAME AND FRESH WATER FISH COMMISSION, 801 N.W. 40TH STREET,
BOCA RATON, FL 33431

AND

WILLIAM M. LEWIS, FISHERIES RESEARCH LABORATORY, SOUTHERN
ILLINOIS UNIVERSITY, CARBONDALE, IL 62901

28 DECEMBER 1982

THIS EXPLORATORY REPORT WAS PREPARED BY THE DEFINITIONS
COMMITTEE FOR THE AFS/EXOTIC FISH SECTION. WE WELCOME REACTIONS
AND COMMENTS FROM SECTION MEMBERS. PLEASE FORWARD THESE TO
PAUL L. SHAFLAND AT ABOVE ADDRESS.

INTRODUCED SPECIES TERMINOLOGY

It was apparent to participants at the 1981 American Fisheries Society's Exotic Fish Symposium held at Albuquerque, NM, that terminology associated with introduced species needed standardization. This need lies in the importance of these species in modern fishery biology. A general consensus regarding usage of existing terminology is lacking, and questions arise frequently regarding its applicability. Development of consistent usage of introduced species terminology among fishery workers would be a major step toward uniform reporting and better understanding of fish introductions.

Many problems arise when attempts are made to standardize terminology that has evolved variable meanings and applications based on individual interpretations and philosophies. In these situations it is unlikely that single definitions could be developed to satisfactorily encompass all situations. As a result the terminology necessarily remains confusing, imprecise and inconsistently applied. The purposes of this report are to (i) briefly review the status of introduced species terminology; (ii) propose a standardized set of terms for use by the American Fisheries Society's Exotic Fish Section that would preferably be multidisciplinary in approach; and (iii) suggest certain taxonomic factors be considered when categorizing different types of species introductions.

Background

The first formal attempt by the American Fisheries Society to categorize introduced species (i.e., species moved by man) was made at the 1969 Invitational Conference on Exotic Fishes and Related Problems, which was co-sponsored by the American Society of Ichthyologists and Herpetologists. Following the political definition given in Webster's International Dictionary (second edition; unabridged), conferees defined an exotic species as one "introduced from a foreign country." At the same meeting, transplanted species were defined as those moved by man "between watersheds within the country of origin" (1969 SFI Bull. 203:1-4).

Later, the 'Position of American Fisheries Society on Introductions of Exotic Aquatic Species' took a different approach stating "Species not native to an ecosystem will be termed exotic" (1973 TAFS 102:274-276). This seems straightforward until one examines the quasi-specific term ecosystem. Ecosystems may be large and complex (e.g., oceans) or small and relatively simple (e.g., temporary ponds). The 1973 definition of exotic has not received wide acceptance, and the earlier definitions purporting the concept of fish nationalities have generally prevailed (e.g., the 1981 AFS/Exotic Fish Section Bylaws in its Newsletter 1(1):3-5).

Using the 1969 definitions, exotic fishes vary from those moved short distances within their native range to those moved between distinctly different biotic communities occurring on different continents. Similarly, transplanted species include

those moved between adjacent watersheds to those moved across impenetrable zoogeographic barriers, such as oceans and major mountain ranges. Thus, categorization of introduced fishes based on this concept is sometimes less meaningful than desired as illustrated by the following hypothetical situations: should a large-mouth bass from Florida introduced into Alaska, Guam or Hawaii be considered a transplant? Similarly, should a fish moved across a national boundary, from one place to another within a river system where it is common, be considered an exotic?

The major disadvantage with the 1969 definitions is they categorize species using political rather than ecological criteria. Unfortunately, ecological barriers are not synonymous with political boundaries, nor are they as easily identified. Furthermore, political boundaries are man-made and temporary, making it possible for some introduced fish to be considered transplants one day and exotics another.

The major advantage of the fish nationality concept is its inherent simplicity. One only needs to determine whether an organism was moved across a national boundary in order to categorize it as an exotic.

Discussion

Most of the confusion surrounding introduced species terminology is associated with (i) differing interpretations of its usage; and (ii) an underlying supposition that 'exotic' implies the most significant introductions. Non-technical words often have more than one meaning or use; however, scientists tend to

quibble over the most proper use of such terminology. As a result scientific terminology normally requires less interpretive and more definitive meanings than non-technical terminology.

The supposition that exotic implies more biologically significant and important introductions is unfounded since biological significance has been ignored in all attempts to categorize introduced species. Biological significance can only become a consideration when sophisticated methods have been developed for predicting and quantifying perturbances caused by these organisms.

Studies involving species moved by man have increased considerably during the past two decades, and much progress has been made towards understanding the value of these organisms. In light of the discussion presented above, it seems inappropriate to continue using political boundaries as the only criterion for categorizing these organisms. This policy should be discontinued, and the term 'introduced' should be used as the most general term referring to any organism moved by man. Although never formally defined in this context, introduced is the most widely understood and consistently applied term currently associated with man's movement of plants and animals.

The most common meaning of exotic in fishery and related sciences refers to organisms introduced from another country. And most state and federal regulations using this term are intended to regulate only these organisms (J.A. McCann, USFWS, Gainesville, FL, pers. comm.). The term transplant has

been used dichotomously with exotic and as such refers to an organism moved about within it's country of origin. Among other things, alteration of these definitions would require concurrent changes in regulations which, though possible, are seemingly unnecessary. Thus, without more substantive arguments than currently exist, these political definitions should be maintained as the only acceptable definitions of these terms.

Recommended Standardized Terminology

Introduced-- a plant or animal not native to the place where found.
Synonym: non-native.

Only two subcategories of introduced species are used commonly enough to be designated as standardized terminology. These are (i) *Exotic*-- one from another country; and (ii) *Transplanted*-- one whose natural range includes a portion of the country where found.

Descriptive terms associated with introduced species are:

Established-- an introduced species with a permanent population(s), i.e., one unlikely to be eliminated by man or natural causes.

Possibly Established-- an introduced species reproducing in an area which cannot be renovated but without the status of a permanent population.

Localized Population-- an introduced species reproducing in an area which can be renovated.

Managed Populations-- an intentionally introduced species that is maintained by man.

Reported Species-- an introduced species collected without evidence of reproduction.

The above terminology provides a working basis for developing a comprehensive set of terms describing man's movement of living organisms. As our knowledge increases, additional criteria for describing these organisms should be developed

Such additions will require new terms in addition to interpretations (i.e., definitions), and every effort should be made to limit each term to a single interpretation. Regardless of the immediate appeal of additional criteria and terminology, it should first withstand the test of extensive peer review and usage prior to its incorporation into the standardized terminology given above.

There is a continuing need to develop introduced species categories based on ecological criteria. One possible way of doing this uses the degree of community similarity between an organism's native and introduced ranges, and adoption of the two infrequently used terms transotic (see acknowledgments) and transferred. Species moved to a biotic community distinctly different from ones in its native range (i.e. one consisting of different indigenous genera belonging to the same class as the species introduced) would be termed transotic, while those moved between similar communities would be termed transferred organisms. Although more complicated, this categorization avoids the inherent short-comings of the political definitions noted earlier.

Introduced fishes may become permanent constituents of their new biotic communities. The question of permanence is important as it largely determines long-term effects of species introductions. Furthermore, monitoring, research and management priorities regarding these species are directly affected by this factor. Neither reproduction nor time is an adequate sole consideration for determining permanence, since some species may

maintain unstable populations for many years prior to disappearance. Only self-perpetuating, stable or expanding populations that are unlikely to be eliminated by man or natural causes should be termed 'established.' Established species should be differentiated from 'possibly established' species, which have reproducing but possibly non-enduring populations.

Combination of the terms and definitions presented here provides a standardized and useful approach to terminology associated with man's movement of fishes. Furthermore, this approach seems applicable to other classes of plants and animals. Realizing individual professional preferences, however, it is recommended that authors continue to specify their definitions when publishing manuscripts on introduced species.

Acknowledgments--The term transotic was coined by Texas Parks and Wildlife Department biologists as a synonym for transplanted (D.L. Pritchard, NMFS, St. Petersburg, FL, pers. comm.). Constructive criticisms were received from reviewers, many of which were incorporated in this report. For these, we sincerely thank R. S. Anderson, R.A. Brandon, W.R. Courtenay, Jr., J.E. Deacon, D.E. Hammond, D.E. Holcomb, H.H. Hobbs, Jr., C.C. Kohler, J.A. McCann, R.J. Metzger, W.L. Minckley, P.B. Moyle, R.L. Noble, D.L. Pritchard, G.C. Radonski, C.R. Robins, P.M. Shafland, W.L. Shelton, C.J. Sindermann, J.N. Taylor, F.J. Ware, R.J. Wattendorf, R.L. Welcomme, J.E. Williams and T.M. Zaret. We also thank B.B. Tiedrich for typing of all drafts of this report.